

Remarks

Applicants respectfully request reconsideration of the above application in view of the present amendments and the following remarks. Claims 26-29 and 36-39 are allowed. Claims 1-25 and 30-35 are rejected. Claims 30-35 are objected to by the Examiner. Claims 1, 7, 8 and 13 have been amended claim 40-41 have been added and claims 30-35 have been canceled to clarify the subject matter which Applicants regards as the invention and to place the claims in condition for allowance. The specific gravity and refractory coating thickness limitations of claims 1, 8, 13, 40 and 41 find support in the specification. (Page 3, Lines 25-26; Page 4, Lines 6-9; Page 4, Lines 13-15; Page 5, Lines 24-25.) The recitation of a specific gravity for the integral body in the range of about 2.3 and about 7.0 is supported by the recognition that the integral body has a specific gravity less than the specific gravity of molten metal, as originally claimed and disclosed. According to ASM Handbooks Online, the specific gravity of metal (pure or alloyed) is typically in the range of about 7.1 and about 7.9.¹ No new matter has been introduced by virtue of the present amendments.

The Examiner objects to claims 30-35 under 37 C.F.R. § 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. According to the Examiner, claims 30-35 do not fairly further limit independent apparatus claims 1 and 13 because the limitations contained in these claims recite only limitations directed to the manner or method of use of the claimed vortex inhibitor, *i.e.* the use of the inhibitor in molten metal containers containing molten metal which would cause the sacrificial member to dissolve at recited points during the discharge of molten metal. Applicants have canceled claims 30-35 without prejudice or waiver to obviate the Examiner's objection.

The Examiner argues that claims 1-25 and 30-35 are indefinite because independent claims 1 and 13 recite that the sacrificial member be constructed to substantially dissolve before they obstruct the discharge nozzle. According to the Examiner, without any

¹ A copy of the web pages disclosing the specific gravity of metal and metal alloy is attached for the Examiner's review.

indication as to what the molten metal is, and the depth of metal in a vessel from which the molten metal is to be poured, as well as the discharge rate out of the molten metal nozzle, it is impossible to ascertain which constructions would meet the limitation of dissolving before obstructing the discharge nozzle, thereby making the scope of the claims unascertainable.

Applicants have canceled claims 30-35 without prejudice or waiver to obviate the Examiner's indefiniteness rejection. With respect to claims 1-25, Applicants have amended independent claims 1 and 13 to recite that the specific gravity of the integral body is about 3.5 to about 7.0 so that the integral body is buoyant in molten metal, and is self-orienting in a narrow end downward position when supported in molten metal. Support for the specific gravity range is found in the specification. (Page 3, Lines 25-26; Page 4, Lines 6-9.) Although Applicants believe that the previously presented versions of claims 1 and 13 provided a complete, definite, and accurate description of the structure of the vortex inhibitor based on the understanding of one of ordinary skill in the art, Applicants have amended the claims to expedite allowance of the claims. The specific gravity of about 3.5 to about 7.0 for the integral body clearly defines the construction of vortex inhibitors that meet the limitation of dissolving before obstructing the discharge nozzle.

For at least the reasons stated above, claims 1 and 13 are not indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regards as the invention. Since the Examiner's basis for indefiniteness of claims 1 and 13 has been successfully traversed, claims 2-12 and 40, depending either directly or indirectly from claim 1 and claims 14-25 and 41, depending either directly or indirectly from claim 13, are also definite. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of claims 1-25 and 30-35 based on 35 U.S.C. § 112, ¶ 2.

The Examiner rejected claims 1, 4, 9, 13, 14, 23-25, and 30-35 under 35 U.S.C. § 102(b) as being anticipated by *Eastwood* (U.S. Patent No. 5,451,036). The Examiner argues that *Eastwood* teaches a vortex inhibitor comprising a uniform refractory body (2) having a generally tapering shape along a longitudinal axis from a base to a narrow end, and including a hollow chamber (3) which may include a shaft (15) and a "sacrificial

member" (10) connected to the uniform refractory body, where the vortex inhibitor is inherently self orienting when supported in the molten metal, thereby showing all aspects of the above claims.

Claims 1, 4, 9, 13, 14, and 23-25 are not anticipated by *Eastwood*. *Eastwood* does not teach, disclose, or suggest, either explicitly or inherently, an elongated sacrificial member constructed to dissolve before substantially obstructing the discharge nozzle by providing an integral body having a specific gravity of about 3.5 to about 7.0, as recited in independent claims 1 and 13.

Eastwood's explicit teachings are directed at improving the strength of conventional metallurgical darts consisting of a head and tail to decrease breakage during handling. ("[t]he basic object of the invention is to provide an improved dart, and an improved method of dart assembly, compared with prior art proposals", Column 1, lines 49-51.) According to *Eastwood*, prior art proposals "consist basically of ... an attached tail ... with at least a portion of the tail extending below the head and being adapted to engage in the tap hole of the furnace[.]" (Column 1, lines 13-15.) To improve upon prior art proposals, *Eastwood* teaches "an elongated tail of refractory material ... such that the tail can pass, as a close fit, through the lining sleeve of the head" (Column 1, lines 59-64) and preferably encasing the tail "in a metallic sleeve or jacket [to provide] considerably more strength than prior art proposals, as the metallic sleeve or jacket protects the refractory during handling." (Column 2, lines 24-28.) Moreover, the primary constituent of *Eastwood's* tail is refractory material — which is meant to endure in a molten metal environment. For at least these reasons, *Eastwood* does not explicitly disclose or teach an elongated sacrificial member constructed to dissolve before substantially obstructing the discharge nozzle.

The Examiner argues that the member (10) of *Eastwood* would eventually dissolve in some unspecified molten metal at some unspecified temperature before reaching a discharge nozzle in some unspecified amount of time and the above claims as explained previously, allow for any molten metal at any temperature where the vortex inhibitor is immersed in the molten metal for any time before reaching the discharge nozzle. The

Examiner urges that the sacrificial nature recited in Applicants' claims is inherently taught by *Eastwood*. However, *Eastwood* does not inherently teach, disclose, or suggest an elongated sacrificial member constructed to dissolve before substantially obstructing the discharge nozzle by providing an integral body having a specific gravity of about 3.5 to about 7.0. "[A]n inherent property must necessarily be present in the invention described by . . . the [claim], and it must be so recognized by persons of ordinary skill in the art. See *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991); *Riney*, 77 F.2d at 528, 25 USPQ at 421 (noting that the inherent property 'would be at once apparent to any one skilled in the art')." *Hitzeman v. Rutter*, 243 F.3d 1345, 1355 (Fed. Cir. 2001). The sacrificial property of the claimed elongated member is not necessarily present in the teachings of *Eastwood* and is not at once apparent to any one skilled in the art.

The Examiner rejected claims 1-25 and 30-35 under 35 U.S.C. § 103(a) as being obvious from the teaching of *Eastwood*. With the ordinary skill in the art, *Eastwood* does not teach, suggest, or motivate the claimed invention. *Eastwood* teaches a structure for improving the longevity and ease of constructing tailed, throttling elements. The ordinary skill in the art recognizes deterioration of a tail in and out of molten metal and teaches how to avoid deterioration by providing a reinforced tail. Moreover, prior art tails because they endure during the pouring process provide a signal that slag intermixture is imminent and flow should be terminated. In substantial departure from the prior art, the Applicants' claims teach how to sacrifice structural integrity to avoid substantial throttling of the flow through the discharge nozzle. The Applicants' claims recite a vortex inhibitor with an elongated sacrificial member that dissolves before substantially obstructing the discharge nozzle, that time period is based on pour time and environmental conditions in the pouring nozzle and a specific gravity of the integral body of at least about 3.5 to about 7.0, which are not addressed in the prior art relied upon by the Examiner.

The statement that the claimed invention is obvious from the teachings of the prior art is supported only by hindsight guided by the Applicants' present disclosure, and does not provide a proper ground for rejection under 35 U.S.C. § 103. Whereas *Eastwood* teaches a structure for improving the longevity and ease of constructing tailed, throttling elements, the

present invention reduces structural longevity and avoids substantial obstruction of the discharge nozzle. As such, the claims of the present invention are not obvious in view of the teachings of *Eastwood* and the knowledge of one of ordinary skill in the art at the time *Eastwood* was made. Applicants respectfully request reconsideration of this rejection in light of the present amendment and remarks.

In summary, Applicants respectfully assert that the pending claims are patentable in view of the *Eastwood* reference. Claim 1, reciting a sacrificial member constructed to dissolve before substantially obstructing the discharge nozzle by providing an integral body having a specific gravity of about 3.5 to about 7.0 is patentable in view of the *Eastwood* reference. Claims 2-12 and 40 depend either directly or indirectly from claim 1 and are, therefore, allowable for at least the same reasons as claim 1 as well as for their own limitations. For instance, claim 40 is directed at an embodiment wherein the sacrificial member has a specific gravity in the range of about 3.5 to about 7.9. This range further defines the sacrificial nature of the Applicants' elongated member. This limitation is not taught, disclosed, or suggested by the prior art of record. Claim 13, reciting a sacrificial member constructed to dissolve before substantially obstructing the discharge nozzle is patentable in view of the *Eastwood* reference. Claims 14-25 and 41 depend either directly or indirectly from claim 13 and are, therefore, allowable for at least the same reasons as claim 13 as well as for their own limitations. For instance, claim 41 is directed at an embodiment wherein the sacrificial member has a specific gravity in the range of about 3.5 to about 7.9. This range further defines the sacrificial nature of the Applicants' elongated member. This limitation is not taught, disclosed, or suggested by the prior art of record.

The present amendment was not earlier presented because the amendment and argument submitted with the prior amendment addressed all stated grounds for rejection in the prior office action. The present amendments and remarks are directed at further illustrating that the Applicants' claimed sacrificial member is meant to deteriorate to avoid substantial throttling. The Examiner has already conducted a search on the sacrificial member concept since this language was recited in the original claims. Therefore, the present invention does not raise any new issues for search or consideration and does not require any further searching


by the Examiner. As such, Applicants submit that the amendment is appropriate for entry, and that the claims are in a condition for allowance. If the Examiner believes that a telephone conference will advance prosecution of this application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

CONCLUSION

For the foregoing reasons, Applicant believes that the Office Action of May 6, 2003 has been fully responded to. In view of the foregoing, Applicants respectfully submit that the present application is now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

ROBERT J. KOFFRON ET AL.

By 
Matthew M. Jakubowski
Reg. No. 44,801
Attorney for Applicant

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BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075
Phone: 248-358-4400
Fax: 248-358-3351